

Aviation News

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First Twin-Engine Commercial Helicopter: Designed to carry 10 passengers plus pilot and co-pilot, or to handle cargo loads of 1 ton or more, the forthcoming Kellett KH-2 helicopter is expected to be the world's first commercial twin-engined helicopter. It will use intermeshing twin rotors with 65 ft. diameter, and will operate from areas the size of a baseball diamond at 90 mph. cruising speed, or 118 mph. top speed, the manufacturer, Kellett Aircraft Corp., North Wales, Penna., estimates. (See story on page 8)

Grounding of Constellations Disrupts Air Services

Fire causes were diverse, according to early indications as tests begin.....Page 7

Kilgore Research Bill Passes Senate, Goes to House

Calls for President-appointed board; patent rights rouse industry opposition.....Page 11

Non-Sched Carriers File Operations Data With CAB

About 20 percent of unscheduled lines meet July 15 report deadline.....Page 17

Expect Mail-Pay Ruling to Give 25c. Rate to Feeders

New lines will need higher payment; traffic calculations too rosy.....Page 34

The Birdmen's Perch

By Major Al Williams, ALIAS, "TATTERED WING OPS,"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.

Did we ever mention that we're fond of waffles?

And all its wonderful people! Like the wonderful engineers who polished the Navy's wonderful counter-messing program. They discovered that the two properties served a waffle-cooking effect—it let traveling slowly in the 1950s (100 miles) do the job properly, for instance—which made the oldest and most expert pilots sleep, grow, and blossom!



And the wonderful girl (a housewife or a professional woman or the opposite sex) who planted down \$1,750 and flew away a surplus P-51 Royal P-51!

And the wonderful beauty who picks up and delivers beauty and day cleaning rates a week, by plane!

And the wonderful laboratory pilot who put an automobile head on his plane to measure expert mechanics when he went overseas!

Yes, we love every wonderful one of us!

We also love the wonderful Al Williams who makes GulfBldg the wonderful laboratory is a.

You probably know that we took on this additional service step after the war has slowly been ended. Maybe because of this, you're wondering if a really made a great deal of difference in the long run. (You thought we told you this the old Al Williams does get more action and change faster out of GulfBldg.)

Well, as when we Al Williams present to you of this and we're already stated by conventional methods—our take out a whole operation and a half of operations leaving only 4 1/2 years of GulfBldg left! But why you get more information with wonderful GulfBldg Ops!

SANBORN-SET... PART 2

We were telling you last month about Sanborn-Set, the which makes day by day business.

And we had a finished. You know what a day part on the life with constant running up to sugar and the word following the rising way, don't you?

Well, with Sanborn-Set from the ground set down a happen! When planning is finished, drawing and drawing made buildings at a moment and as a simple installation of the set due to "know way."

And a simple application of this drawing upon effect has a whole new. It doesn't require. It doesn't need every doing into.

Want some more information? Drop us a card.

LITTLE KNOWN FACTS DEPT.

Here's another month, just by the way with Best Gasoline Fresh Pilot in The Little Known Facts About Well Known Places Department.

Meanwhile, here are the new Perch

Phases (Donner wing) and the "Perch" that was then that took.

Salvage Hardware (P 0707), 250 000 Ave. N. Y. C., is now a Fresh Pilot because.

"Which Way I beguery used about others and should have a 'fresh' (fresh) door." They were operated by the pilot and designed to reduce wind resistance after the door was dropped through the paper beach line concept!

How about that?

And William Murphy, 101 Ferry Street, Millis, Mass., is now a Fresh Pilot (P) because he discovered.



"I took a Fresh Pilot longer to fly from Boston to New York than it does to fly from New York to Boston, according to the Sanborn-Set. Fresh Pilot!"

Okay, now you try. Yes, YES! Mail your "Perch" to the address above.

Gulf Oil Corporation and Gulf Refining Company...makers of



THE AVIATION NEWS

Washington Observer



SURPLUS TRANSPORTS ABROAD—Canadian and Latin American prospective purchasers of surplus C-54s, unable to find surplus aircraft in the U. S., are journeying to Europe to inspect stocks of the Foreign Legislative Commission, FLC in France since last nearly 50 C-54s in good condition which are for sale at prices averaging \$30,000. U. S. customers are forbidden to bring back surplus stocks abroad, but FLC is tomorrow before that permission can be granted to veterans to buy from FLC stocks provided the planes will be used only as their own business.

BARGAIN BASEMENT TRAINING—Some of the major schools are beginning to worry about the effect of "bargain basement" flight instruction being offered to veterans under the G. I. Bill of Rights program. At least two leading schools have stopped accepting students for private pilot training because they are unwilling to meet the price cut of "bargain basement" competitors. Although Veterans Administration estimated a cutting of \$10.50 per hour for dual instruction, many large flight schools charge only \$9 or \$10. Now, some smaller schools at low as \$5.

SERVICE CHARGES OR TAXES?—In their discussions with T. F. Wright on CAA's new fees for aircraft registration and other services, industry representatives debated at length over whether the charges were "taxes" imposed by administrative rather than legislative decree. Part of the discussion, industry people to have charges, if they are deemed necessary, imposed by Congress, as great as opportunity for application before the proper committee. CAA contends that these service charges which Congress directed to be levied, and are not taxes.

CAB SIDES BACKLOG—Disputes with which Civil Aeronautics Board has been considering and disposing of pending cases brings a prediction from a high CAB source that by Jan. 1 it will be operating on a case-by-case basis. Decisions are expected soon on the Trans-Ohio and North Central area cases, although the former was argued only last month.

POSTAGE CUT FADES—Alonso from Washington of shipping-out Postmaster General Robert H. Bennett and Second Assistant Postmaster General Carl Sullivan, first officers for Senate action on the five-year postal bill, deterring a cut in annual postage from eight cents on stamps to five. Bennett and Sullivan are not expected to return until mid-August. Sen. Dennis Chavez, chairman of the Senate Post Office

Committee, notes that his group will withhold action on the bill until Bennett and Sullivan return and notify on the P.O.'s overall policy on mail service. Congress may attempt in the meantime. Railroad interest has which object to the lowering of the stamp rate, which would capture a considerable volume of the mail now shipped by rail.

BRIDGES DEFENDS AIR FORCE—The road damage inflicted by the AAF during the war could have been reduced by 100 percent, if equipped with some bombs, according to New Hampshire Sen. Styles Bridges. In a Senate speech concerning attempts to reduce the effectiveness of the bomb and the AAF—as the basis of results of the British note—by "people... trying to pull the wool over the eyes of America for their own purposes," Bridges reported that during the war the AAF dropped a rough total of 1,000,000 tons of bombs. The U. S. could have done the same effective weight of explosives, he asserted, against 100 enemy camps by dispatching 100 aircraft, each carrying one atomic bomb. The 100-aircraft attack would kill off 10,000,000, he said, "and defeat in one stroke the nation in which it was directed."

SAFETY BUREAU GROWS—CAA's Safety Bureau, confused with increased demands as an increased personnel in scheduled and non-scheduled operations grow and in damage increased through changes in accident investigation methods (Aviation News, April 20), has sensitive plans for expansion of its staff and major changes in its organization chart. These changes include increase in personnel of all three divisions: accident analysis, safety rules, and accident investigation, particularly the addition of six men to the 16 field investigation now in the accident investigation division, and multiplication of a Bureau office in Anchorage, Alaska. The Bureau has had a long authorized personnel of 63, including clerical help, but hopes that recent Congressional appropriations will permit an enlargement to 116.

DECENTRALIZATION IN AGASP—Industry workers of it is again to be confronted with the task of decentralizing the aircraft industry, in the wake of the DOD report on possible preventive steps against war bonds. The report declared a need for decentralizing industrial and medical facilities. This subject, as it pertains to aircraft, has been discussed for months, following an explanation to the Army that the aircraft industry did not oppose decentralization provided it included all industry, and not just facilities for aircraft.



PAN AMERICAN WORLD AIRWAYS

orders a fleet of 20 new Convair-240's!

PAN AMERICAN WORLD AIRWAYS, with its globe-girdling network of air routes, is another major airline ordering a fleet of America's most modern post-war airliner—the Convair-240.

This airline selected the Convair-240 as the best for a new type of transport plane, to supplement its large 4-engine ships—used to offer speed and advanced comfort features to the air-traveling

public on flights of international range.

It was only natural that in its search for such an aircraft, Pan American should turn to Consolidated Vultee—the company which designed and built the famed Liberator bomber, the Catalina patrol bomber, the Coronado, and other well-known war planes—the company which operated a vast transoceanic military airmail service for the Air Trans-

port Command during World War II.

The wonderful new Convair-240 airliner will carry 40 passengers at 300 miles per hour and with a new high standard in air-craft comfort and convenience.

Below, for example, you'll find ten of the many reasons why your first flight on the modern new Convair-240 airliner will be an experience you'll want to repeat over and over again!

CONSOLIDATED VULTEE AIRCRAFT CORPORATION

San Diego, California • Denver, California • Wayne, Michigan (Detroit Office) • Fort Worth, Texas • Nashville, Tennessee

10 reasons why you'll enjoy flying in the Convair-240

1. 46 Passengers—at 300 M.P.H.!
2. Auxiliary jet exhaust thrust—air speed!
3. You'll fly in a quiet, air-conditioned cabin!
4. "Air Brakes" for smoother landings!
5. You'll enjoy "See Level" roadster at high altitude!
6. Hinged wings prevent icing!
7. Tricycle landing gear with dual tires!
8. Full-visibility cockpit—air added safety!
9. New safety-type wing!
10. You'll relax in cozy chair comfort!

Grounding Constellations Disrupts All International Air Services

Early indications that TWA and PAA firms not due to same cause, tests underway with fuel injection systems; no indication that giant transports will be flown until after CAA hearing.

By WILLIAM KROGER

Through what seemed to be an unfortunate chain of circumstances, rather than a major fault in the aircraft involved, U. S. air transport was crippled last week and the future of two of the biggest companies in aviation hangs in the balance.

An accident occurred at Reading, Pa., to one of Lockheed Aircraft Corp.'s Constellations, the newest, biggest and fastest U. S. airliner, one shortly after another "Constellation" mishap at Williamsburg, Conn. CAA grounded all Constellations. TWA, Inc., operator of the plane at Reading, as well as Pan American World Airways, involved in the Williamsburg incident, and American Overseas Airlines were affected.

BOAC, the first to operate the Constellation, the effect was felt by British Overseas Airways Corp., which recently resumed U. S.-England service, using "Constellation" and whose Constellation, following the lead of CAA, grounded the carrier's Constellations.

At Burbank, Calif., Lockheed set with orders for 121 Constellations, involving some \$85,000,000. 70 have been delivered, 60 to airlines, 10 to the Army.

TWA, whose president, Jack Frye, collaborated in the design of the aircraft, shared with Lockheed the biggest stake in the situation. TWA's future plans were in a large extent built around the "Constellation" with the expectation that 39 would be in service before the end of the year, and 20 more on order.

With 46 Constellations grounded (TWA: 13; PAA: 21; BOAC: 2), international operations had to halt. DC-4's on domestic routes to take up some slack. In addition, TWA had been flying 30 "Constellation" domestically. This made

such order would cripple or stall after the hearing.

New Engines—One distinct benefit it is in the offing: when the Constellations are permitted to operate again, if not all, will have the engines equipped with direct fuel injection systems. Lockheed had a test plane in the air last week with this innovation. The system, developed by Curtiss-Wright, maker of the Model 334B engines powering the "Constellation," has been given a temporary CAA certificate which will be made permanent when 100 hours have been flown. Also, Lockheed was rushing direct fuel injection conversions into the Constellation users.

But while out of the grounding will come a long-delayed improvement in the fuel system, none of the three accidents which directly prompted the suspension order could be laid to malfunctioning of the fuel system.

The chronology is this: last Fall, a Constellation operated by Pan Am for the Air Transport Command caught fire at Topeka, Kans. Last month, a Pan Am-operated "Constellation" on commercial service caught fire near Cincinnati, but was landed at Williamsport without injury to passengers or crew. Week before last, came the Reading accident when a Constellation with TWA personnel on a training flight caught fire and crashed.

Two Constellation—The Topeka and Williamsburg accidents are the



TEST-TUBE MITCHELL

A North American Mitchell bomber, designated B-25J-25NC, being used at Wright to experiment with a variety of radar detectors. Test installations are shown at the tail and under the nose. (Marines & Kelson photo)

ulated to a break in the shaft through which power was transmitted from the engine to the carbon-purification system. Either the deluged shaft, or some other part, clipped the hydraulic fuel line, spraying the liquid under pressure onto the red-hot shaft.

Although no official cause can be given for the Reading accident, inferred outcomes of the hearing, informed sources gave this version: A fire started in the passenger cabin of the plane, filling it with smoke. All of the crew were up front. One went back for some reason and left a door open and the pilot compartment then became so overwhelmed the pilot was unable even to see the instruments. Before he could get a window open, the plane had lost its speed altitude as it made a crash of the craft unsalvageable.

Drifting around these subject data are a host of reports, charges, guesses and opinions. Chief of these is that fires have not been strange to the CoastRangers (Donald L. Schwabe, president of the Air Line Pilots Association, insists that "a defense fire hazard" exists in CoastRangers, and called for a Congressional investigation.) Actually, according to Lockhead, there have been two induction system fires, caused by beesfires, and both have been repair in extent.

▶ Testing Flies — Lockheed and TWA engineers are collaborating in a series of tests, deliberately starting induction fires, and then extinguishing them. Only apparent result is that induction fires can be started and can be extinguished easily.

One possibility advanced for the cause of the Reading fire is the electrical system. Leading point to this theory was the fact that last week both Lockheed and TWA were investigating the electrical system of the big plane. While CAA has given permission for "Cessna" to be flown back to the home base, TWA is not moving theirs until completing the electrical system study.

Overall opinion of many in the industry is that Lockheed and TWA were the principal two victims of a series of once-in-a-lifetime happenings. Unlike other large lessorships now in operation, the Constellation in a sense is being "preserved" in the name of commercial operation. It is the biggest, newest, and fastest plane in use. It has "bugs" and operational cracks all its own.



WILSON HONORED

Mr. Gen. Arthur S. Wilson, TWA vice president and a former top-ranking Army officer in Europe, is accompanied by British Ambassador Lord Jowett after the presentation to Wilson of the order of the Military Cross of the Order of the Bath. Wilson was cited for his work as commanding general, central command sector, COMUSMACV, in the European Theater of Operations.

Blackbeard's Answer—It will take some time for all of these to become apparent and be corrected.

Meanwhile, the demand for air transportation is so great and the flying equipment list is limited that the "Connors" had to be put in service because of their new, fast, because they are extremely speedsters, and—perhaps primarily—because international air travel is growing so fast, a workshop involving a Consortium draws disproportionate attention.

Lockheed's answer is a string of figures from the record: 168,799,080 passenger miles flown without injury to any occupant (said the flooding accident); three and one-half years of flight experience without accidents, tests by the Army at Wright Field through which the "Comet" came with better-than-average ratings.

With the exception of the switch to direct fuel injection, systems planned for some time (the first of the new "Cassids" with this system will be off the line this Fall), Lockheed plans no major changes in the aircraft. Pratt and Whitney R-2800 engines have been optional equipment all along; some purchasers have ordered this installation and these ships will be flying some time next spring.

Twin Engine 'Copter
Developed by Kellett

Commercial version of ordinary model powered by two Continental 550 HP engines; will cruise at 90 mph, carry 12 passengers.

The first twin-engine commercial helicopter is in process of development from Kellon Aviation Corp.'s twin-engine military helicopter, the NH-8.

An experimental vehicle, the proposed Model KH-2 will either carry 10 passengers or a cargo load of one ton or more, besides a crew of two, and can operate from a field the size of a baseball diamond, said President W. Wallace Kellert.

Flight testing is due soon on the army helicopter, now being completed. Following these tests, Kellert will build the commercial version, which will have eight passengers and a four-ton cargo load. The company now has a full scale mock-up of the commercial version available for inspection at the plant at North Wales, Penna.

► L188 Interceptor—Powered with two 554 hp Continental engines carried in nacelles at the sides of the fuselage, the L188-2 is designed for a 90 mph cruising speed, top speed of 410 mph and two landing speeds. Absolute ceiling is expected to be over 35,000 ft, and the machine is to have cruising range with fuel reserve, of 194 miles, when carrying 2,800 lbs payload and 122 gallons of fuel.

The landing resembles that of a conventional transport plane and is equipped with tricycle gear and triple tailfin. The system of two rotors with synchrodriven intermeshing "egg-beater" blades, which has been used successfully previously on the smaller Sikorski HO4S Army two-place helicopter and also on the German Flettner helicopters, will be used on the XH-19 and on the KH-3.

Principal advantage of the KH-2 over other helicopters previously announced is seen in the added reliability of its two engines. Power transmission is designed so that it can operate with either engine in emergencies.

All-Metal Construction.—The all-metal aircraft is to have styling comparable to the most modern Ford-wing transports, and is expected to have excellent stability and lack of vibration.

The first NH-3a bulb will be

offered as transport services providing air transport between military or residential areas and military commercial airline terminal airports. Additional shuttle and short-haul operations are being developed through conferences with industrial users. Initial operating costs studies indicate that passengers will pay rates in the range of 10 cents per mile for the same distances.

Pratt & Whitney and the company expected to commence full-scale development of multi-engine turboprop-type helicopters, and hoped to announce conditional orders for a "moderate initial quantity" of the commercial helicopters following the flight tests of the military version. The price of the KH-5, not yet fixed, will be comparable to turbopropeller prices for conventional twin-engine heavy performance airplanes of similar all-metal construction. (See photo.)

Conferences Cancelled

The National Aeronautic Association has cancelled both its Airport Users Conference, and Air Youth Conference, originally scheduled for this week and next in Milwaukee, Wis. Inability to obtain complete panels of speakers because of vacations is given as the reason.

AVIATION CALENDAR

[illegible]

Stoll New Manager Of Bendix Products

Manhart gets top sales post; West returns as Boston vice-president

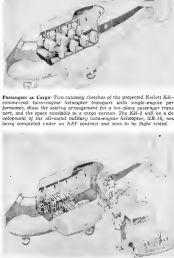
George E. Stoll has been appointed general manager of the Bendix products division of the Bendix Aviation Corp. He has been with Bendix since 1929 and has been assistant general manager of the products division since 1942. J. H. Quinn will be Stoll's assistant.

Charles D. Mayhew has been



G. E. Smith C. D. Mackay

named sales manager in charge of all service products sales of the division, and L. F. Richardson to his new assistant, Markham, a former



army pilot, has been with Bendix since 1933. Other appointments:

► **Boring Aircraft Corp.**—H. Q. West has resigned as vice president-president. H. F. Brown, formerly works manager of the Wichita division, succeeds him.

► **Bendix**—Thomas E. Lockett, former controller of the company in Bogotá, Colombia, has resigned from the State Department to become a vice-president of Bendix.

► **Armstrong**—F. D. Miller has been named to succeed J. H. Wood as director of cargo sales with Joseph Doylan, formerly general cargo agent, as his assistant.

► **National**—G. M. Pearson has been appointed manager of the new air cargo division. He was formerly manager of traffic and schedules.

► **Wiggins**—Edward S. Kinross, former Navy commander, is now assistant to the president. He was formerly a floor member of the House Stock Exchange and a partner in Ryan Whitney & Co.

► **EMCA**—A. H. Greer, formerly of Trans-Canada Airlines, is now agency and aviation public relations executive in New York. Louis Donnelly, formerly with the State Department, is Washington public relations director.

► **Chicago & Northern**—D. G. Richardson has been named assistant to the executive vice-president and will be in charge of developing New Orleans-Gambles routes recently awarded CIB by CAB.

► **Air Cargo Transport**—Herbert A. Walker, a financial executive of the Atlas Corp. for 26 years, has been named controller.

► **Pan-American**—Gydwinter J. Tall, has been named special representative in the Scandinavian countries with headquarters in Stockholm.

► **Frederick Aultman Airlines**—Doris Miller has been named assistant to vice-president Joseph Aultman. She was formerly with the CAB and American Airlines.

► **Flowers Airlines**—Robert L. Reed, former technical expert in the AAF, has been named superintendent of maintenance.

► **Hughes Express Line**—Allen Chase, president of Standardized Aircraft, Inc., of Los Angeles, the Maitre-a-Les Corp., Honolulu and the Commercial Report and Report Co., Mexico, D. F., James E. Davidson, president of the Great Western Aircraft Company of Los Angeles, Durand Shaw, vice-president of the Market Basket supermarket chain in Southern California, and T. J. Sullivan, president of Finance Syndicate, Chicago, have been named to the board of directors of National Skyway Freight Corp.

Half Propeller Failed, Hughes Tells Doctor

Critically injured, in the crash of his new XF-111 army photomapper plane, Howard Hughes, multi-millionaire pilot and aircraft builder last week told his physician, Dr. Verne H. Brown that he believed the four-bladed rear half of his right propeller had reversed pitch and caused the accident. (An ANATON has been sent last week Hughes was reported gaining strength but not out of danger.)

"The surprise fell as if someone had tied a hand door blade inside onto the right wing. The front four blades of the (quad-rotation) propeller were trying to push the airplane ahead while the rear four blades were trying equally hard to push it backward. Those eight blade whirling around, fighting each other, created a dead drag on the right hand side, equal to that of a steel rod, seventeen feet in diameter, turned blade-side to the wind at several hundred miles per hour," Hughes said.

The pilot looked out the windows of the cabin, thinking that some large part such as a section of the wing, tail or landing gear door might have torn loose and swung into a head-on position, but could see

nothing which affected the flight. "Yet it felt as if some giant had the right wing of the airplane on his hand and was pushing it back and down. I have thought about it carefully. I am absolutely certain it was the propeller. Tell the Army to look at the wreckage, find the rear half of the right propeller and find out what went wrong with it. I don't want this to happen to somebody else," he insisted.

Cause of Army Nightmare Crash Is Undetermined

A clean bill of health was given to both the Douglas-built XF-111 photomapper and its two Allison V-1710 engines in the report of the Army's board investigating the accident last December which destroyed the nationally-designed aircraft.

While stating that the cause of the accident could not be determined definitely, the board expressed the opinion that the possibility of fast shuttles could not be discounted.

On a routine flight over Washington, the XF-111's engines cut out and the plane's occupants parachuted to safety. The photomapper had flown to Washington from Los Angeles, enroute to a new military record of the house, IT mascot.



GLOBEMASTER INTERIOR

The 75 ft by 17½ ft cargo hold of the Douglas C-74 Globemaster II carries a load of 45,000 lbs, has a range greater than 7,000 miles and a top speed of 215 mph. The plane has drive loading elevators to permit loading from ground level, each capable of carrying a 15,000-lb unit.

Research Problem Put to House As Senate Passes Kilgore Bill

Patent rights are big bone of industry opposition; plan calls for Presidential appointed board and \$15,000 a year administration.

The aircraft industry last week was watching the House for an indication of what form its future research and development contracts would take as far as patent rights are concerned.

The Senate has put the issue up to the House by passing the National Science Foundation bill which, in effect, reverses the long-standing settled between the Army and Navy and the industry of funding inventions arising from research contracts.

Remembering from two separate occasions originally proposed a year ago by Sen. Warren G. Magnuson (D-Wash.) and Rep. William Kilgore (D-W. Va.), the bill is passed under a Foundation to be administered by a \$15,000-a-year Administration appointed by the President after recommendations by a National Science Board, also appointed by the President.

► **Plan Seeks Devolution**—The Foundation would comprise seven divisions, including one for national defense, one for engineering and technology, one for scientific personnel and education, and one for publications and information. Other divisions would be concerned with mathematical and physical sciences, biological sciences and health and medical sciences.

The Foundation would not do research, but would coordinate government affairs and authorize work under grants by private research firms and educational institutions.

Fully in accord with the principles and objectives of the bill, the industry takes a new view of Section 8 which—in an attempt to further the aim of making the findings "fully and freely available to the public"—lays down strict regulations regarding publication of inventions based on Federally-aided research and development.

► **Patent Provision**—Section 8 provides that such inventions shall be made freely available to the public and, if patented, be freely dedicated to the public within certain limits. One of these is that the head of the Government contracting agency may arrange for the contractor to obtain patent rights if (1) he

makes a "finding that the agency has made every reasonable effort to arrange for the conduct of the necessary research without interfering with the patent rights of the contractor; (2) the contractor makes, or has made, substantial contribution to the development with his own funds; or (3) the Government is given an irrevocable, non-exclusive, royalty-free license to use the invention.

The industry's objection to the patent provisions of the bill are based on the theory that patents, and royalties arising from them, are incentives to research. There is serious with the view that when the Government finances all research, inventions stemming from it should be Government-owned. But when private funds have contributed to the development, the industry believes that incentive will be destroyed by making the resultant inventions public property.

► **Patent in Opposition**—On this issue, the Aircraft Industries Association, as well as the Navy Industrial League, opposed the patent provisions of the Kilgore bill, supporters insisted an amendment introduced.

Boring Uses Turbo

The Boring Turbocharger will be the world's first commercial turbosupercharger for the new four-cylinder General Electric engine turbo-propellers. The installation is claimed to be able to give the engines of the 44-engine double-deck, airliner up to a maximum of 16% in fuel consumption at cruising altitudes.

The turbo-propeller was first tested and perfected in the engine test cell at the B-31 engine from the form of otherwise wasted exhaust gas.

In addition to supercharging the 44 by 100 and 100 by 100, the new turbo also will provide air for the 44's auxiliary-combustion system. The engine is smaller and lighter in weight than the conventional turbopropeller. It is designed to supercharge the engine at cruising powers only and is not needed during takeoff.



MEDAL TO VON KARMAN:

General Carl A. Spaatz, AAF commanding general, gave the Medal for Merit on Dr. Theodore von Kármán, director of the Department of Aeronautics Laboratory at California Institute of Technology, for his contributions to aeronautical research during the war (IHS photo).

to Sen. Alexander Smith (R-N.H.) which would require merely that each contract be by the Foundation contain provision for the disposition of inventions so as to protect both the public and also the contractor.

ALA pointed out that the War and Navy Departments have objected to the patent provisions on the ground that they would restrict the number of firms willing and able to participate in research work.

With the Senate amendment passed down, in almost a straight party split, the Kilgore bill went to the House Interstate and Foreign Commerce Committee, a subcommittee of which already has completed hearings on a bill introduced by Rep. Wilbur D. Mills, (D-Ind.). This measure is a companion of the original Magnuson bill, and contains a patent clause similar to that introduced by Smith in the Senate.

A House committee spokesman said last week that an action had been decided on the Senate bill. But the subcommittee reported the Mills bill to the full committee. If the committee should report on the Mills bill, the controversial patent section thus would have to be dropped and in a Senate House conference committee under the applicable parts of the Kilgore bill were inserted during the House debate.



WE ARE RAISING THE PRICE OF THE *Seabee*

Effective July 15, 1946, the list price of the standard Republic Seabee

becomes \$4495. *€* The original figure conceived late in '45, was based on :

sound evaluations of man-hour and material expenses Since V-E Day, because

costs of every part...increased in the plane itself...and the delivery

rate in wages by Republic to meet increased living needs, are the sole

reasons for the new price. *€* The first plane Seabee amphibian is of all metal

construction, including wing and control surfaces. It is built by the masters of

the mighty T-12 Superfort, its standards of ruggedness and performance which

would cost thousands more if it were not for Republic's simplified methods of

design and manufacture. *€* Of prime importance in the contract, we have

refused to consider any compromise with standards of material or workmanship.

Now, despite the modest increase, this versatile airplane is without question

the unparalleled buy which offers the outstanding value for 1946-47.

Republic Aircraft Corporation, Farmingdale, Long Island, New York.



PRIVATE FLYING

New Sensenich Controllable Propeller Built for Lightplanes

Two-position blade shifted by cockpit control light-planes as
Piper L-4 model; CAA approves two hub sizes

By ALEXANDER MCGURLEY

First details released describing the new hydraulic controllable lightplane propeller developed by Sensenich Brothers, of Lancaster, Penna., disclose that the manufacturer has already obtained CAA approval on two different hub sizes, has made numerous test flights with it on lightplanes, and has accumulated considerable flight experience with it on the Piper XL-14 experimental Army liaison plane.

Basically, the new Sensenich Skyblade is a two-position model which "shifts gears" from high to low pitch and back again, at the will of the pilot, by operation of a single cockpit control. The two blades are held in high pitch position by the twisting force of centrifugal action upon two counterweights which are attached to the blade shanks.

To shift to low pitch, the pilot's cockpit control opens a two-position air control valve on the engine, which permits air to flow from the engine oil pressure system into a cylinder in the hub, pushing the cylinder forward. Movement of the cylinder is transmitted to an arm which actuates two levers which actually pull the blades around from high to low pitch.

Flies Successfully.—The two-position propeller has already been flown successfully but, as yet, without slip, with a new constant speed governor attachment, which is offered under the two-position propeller a constant-speed propeller. The governor, built by another manufacturer, is still in experimental status and has not yet been announced.

In addition to the two-year Culver Cadet used by Sensenich as a test plane for the Skyblade, it has been flown extensively on the post-war Culver Model V two-place plane and is being specified as standard factory-installed equipment on that plane. The Culver

Model V installation uses a hub which has CAA approval for 55 hp at 2600 rpm continuously, with 5500 rpm permissible at takeoff. A larger hub already has CAA approval for 150 hp at 2600 rpm continuous, with 165 hp at 2800 rpm permissible at takeoff. This second hub is similar to the one used on the Piper XL-14 liaison plane, and approved by the AAF for that use in June 1945.

The propeller is designed for use with engines equipped with fan-type main-shafts. It also requires that the engine be provided with an oil pump connecting the engine lubricating oil pressure source with



New Prep.—Installation of the new Sensenich Brothers two-position hydraulic propeller, on the Culver Model V two-place personal plane, shows laminated birch blades with stainless steel tips and metal leading edge strips, counterweights on blade shanks. Model shown has CAA approval for 55 hp at 2600 rpm continuous, with 2600 rpm for take-off.

The front end of the hidden propeller shaft.

As Sensitive Users.—The manufacturer anticipates that the Skyblade will be specified as alternate equipment at extra cost on many of the newer model planes coming on the market. Interest in test flying the new model has already been expressed by many companies, among them Piper, Stinson, Taylorcraft, Cessna, Cavanaugh, also Globe Rortel and Johnson Rockets.

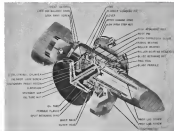
Present indications are that the company can sell all its own product in the immediate future for planes using the newer model engine already equipped to use it. Eventually it is likely that the engine manufacturer may modify some of the older type engines for change type shaft and the oil passage from the engine oil system to the propeller.

The hub assembly uses a hollow alloy steel forging for the hub body, with steel and magnesium bushings, stainless steel bearings which serve as bearings for the pitch control cylinder. Inside the pitch control cylinder is a phenolic stationary piston fastened to the oil tube. A stainless steel flange serves as an expansion and contraction of the oil tube assembly and the front cylinder and cap.

Construction Details.—The pitch change actuating arm is threaded into the pitch control cylinder, and moves with it. Two steel pins as such one of the hub body serve as fulcrums for the lever arm which links the pitch change actuating arm to the pitch adjustment blades and the pins to each female flange. Cylinder link serves engine support plate in the pitch control cylinder to prevent rotation while the cylinder is operating.

The blades are built of maple wood laminations bonded with either a phenolic resin glue or a thermosetting resin glue which graduates a wetproof glue joint. Steel ferrules are attached by screws to the wood blade shanks. Oil lubrication of the blades is secured either with kerosene, or a plastic slushing gland to the wood. Stainless steel wing tips and metal leading edge strips are attached to tip and leading edge with screws and continuous rivets. The blades are coated with a special propeller varnish, as protection against moisture penetration.

Built by a conservative company which has more of its fan-type propellers in fact than any other manufacturer the new two-position



Stenach Prop Cutaway: Cutaway drawing of new Stenach Brothers two-person hydraulic propeller hub shows extracting mechanism, assembly of parts, method of attachment to fuselage-type installation.

Stenach model is a strong indication of the growing trend toward variable pitch propellers for all but the midsize-price personal planes, noted in *Aviation News* July 18. The company makes no announcement of claims of performance for its new product, beyond a statement that a considerable increase in fuel economy is obtained at cruising level: 8,000 ft. or more.

Pittsburgh Leading Base For Seaplanes, Survey Shows

A survey by Kila Aircraft Corp., College Point, Long Island, indicates that Pittsburgh is probably the busiest center of seaplane flying in the nation. Ten seaplane bases are already in operation in the Pittsburgh area, and another is under construction. The bases have



\$3 AN HOUR PLUS DUES:

Members of the Lunde United Flyers Club, Inc., Tonawanda, N. Y., are shown taking delivery on their new *Avrocar* Champion at Niagara Falls airport, from Billy Dwyer (left) of Niagara Falls Aeronautical Corp. The 15 club-members all employ of Lunde Air Products Co., pay \$3 a month dues in the club, and \$3 an hour for flying time, agreeing to pay for a minimum of 2 hrs. flight time a month.

an average of three seaplanes a day in operation and many additional planes on order. Explanation for the seaplane flying in the heart of the Alleghenies, is the fact that there is available more smooth water surface for landings and takeoffs than level land masses.

Fairchild Leases Site For New Plane Center

Stratford Field, Kansas, is being leased and developed for personal planes.

Fairchild Engine and Airplane Corp. has leased buildings and installations at the former army pilot training center at Stratford Field, Kansas, for a new personal plane manufacturing and development center.

While details of the new planes to be produced here have not been disclosed it is known that the company has under development a four-place, all-metal, low-wing, single-engine, instrument designed for the Model P-47, which will be powered by a Continental 185 hp. engine, and is expected to cruise at approximately 180 mph.

A new all-Dallas—Currently, Fairchild's Personal Plane Division is located at Dallas, where Tron Engineering and Manufacturing Co. is producing Fairchild's pre-war bi-wing four-place plane, the P-34, under sub-contract to be marketed by Fairchild distribution. The move of the division to Stratford Field indicates that Fairchild is returning to active manufacture of personal planes after the cessation of such activities in the war to make room for the C-47 twin-engine cargo planes and engines.

J. Cullen Wood, Fairchild president, said last week that the new location on a 150 acre former field with about 8,000 ft. runways affords excellent facilities both for development and manufacture of personal planes. He said the company would continue its extensive research and development program for personal planes under supervision of Sherman H. Fairchild, chairman of the board.

McKay in Charge—Harry N. McKay, general manager of the Personal Plane Division, will supervise production at the Stratford Field plant. He has been with Fairchild since 1942, formerly was vice-president of St. Louis Aircraft Corp., and recently succeeded Lee Smith as manager of the Division. Harvey

Gray is director of sales and service for the division.

Fairchild has signed an eight-year lease with World and Aeronautics City, Kan, the two municipalities which hold title to Stratford Field since its release by the Army, and which will operate it jointly as a municipal airport.

Besides the active manufacturing activity at the new center, the new plant will include a large service base and spare parts change center for Fairchild personal-type aircraft including the P-34, and PT-41 two-seater trainer, now being sold widely as a personal plane.

Anti-Noise Campaign Is Making Progress

South by CAA act prep bond on issuing ATA outline problem of airports.

Campaign of CAA Administrator T. P. Wright, and his assistant John H. Gorme, for reduction of noise caused by airports last week won significant favorable results including:

A report from a technical committee of the Aircraft Industry Association defining the problem generally for large airports, which actually cost most of the racket.

Studies at Bush Field, Augusta, Ga., CAA base, on the distress propellers of surplus army trainer types, which are another principal offender.

Continuation of lightweight noise abatement studies by the National Advisory Committee for Aeronautics.

Administrator Wright appealed for quieter airplanes and quieter operational procedure, pointing out that aviation is facing a severe handicap in losing new airports, because of the public antagonism to airplane noise.

A report prepared by a committee of aircraft industry engineers headed by A. E. Raymond, vice-president of Douglas Aircraft Company, is answer to the Administrator's appeal analyzed the problem of aircraft noise reduction that:

- Changes in propeller blade form, disc area, etc., can vary propeller sound output through a range of 30 decibels, and is worth investigating.
- Use of a hot spot in connection with engine exhaust provides a reduction of noise level on the order of 10 decibels without commensurate reduction in jet thrust.
- Compounding turbo-jet engines

New Roadable Plane

Completed—Vulcan Aircraft Corp. disclosed last week it is testing a new experimental two-person roadable plane, with convertible wing, at San Diego, Calif. The new plane is designed by T. P. Hill, who is in charge of its development. Hill previously had designed the roadable plane for Cessna which was flown in 1946, and now efforts are being made by Southern Aircraft Division, for additional development. (Aircraft News Feb. 4, 11, and 28, 1946). The second roadable plane has all-metal fuselage with fabric-covered wing and tail surfaces. Like its predecessor it uses a tractor propeller arrangement.

so that energy is delivered to a drive shaft which may be expected to result in appreciable noise reduction.

Progress has been made in obtaining consent to present transmission of noise sound to ground.

Effect of jet engines on ground bases has not been fully deter-

mined, but the noise is to higher frequency and is certainly heard for a shorter time at any one point on the ground.

The report indicated that the noise problem was growing in proportion as power of engines went up, and that solution of the problem was regarded as highly important both from the standpoint of area of the aircraft and from the standpoint of people on the ground.

'We have reached the point of no return for conventional sound-proofing' (ed. index of transport planes) the report said.

Grains reported that studies were going on at Bush Field, with propellers for the objectionably noisy military trainer type planes. Investigation includes use of clipped tip propellers. Preliminary results indicate blades of appreciably smaller diameter, with resultant lower tip speeds, can be used with only a negligible loss at the power required.

For lightplanes, NACA has already indicated that the multi-bladed propeller or turbine at slow



PROPOSED FLIGHT PLANNER:

CAA has asked personal aircraft manufacturers to study possibilities of an experimental indicator, shown above, which will supply a pilot with easy-to-use information about his plane's performance in varying conditions of altitude, temperature and gross weight. A clasp attached the indicator is the instrument panel to be available for instant use just before takeoff or landing. To operate, the pilot turns a knob at the bottom until the proper setting for gross weight, altitude and temperature appears. The other dials then show exactly what his plane will do in those conditions. The indicator may be especially useful for pilots in high and mountainous country who frequently fly at marginal altitudes, and temperatures. Performance data would be calculated and supplied automatically for each plane type of manufacturers use in favor of its use in personal planes.

This Fateful Atom... can Serve Man...

1 ORE TO U235

Only 0.7% of natural uranium is U235



2 CHAIN REACTION

fragments from earlier nuclear explosions smash other nuclei



LOCKER HALL twelve months to the birth of Year 1, Atomic Age, we begin to see the scientific impact of the atomic bomb that blasted the world down at Alamogordo, N. M., on July 16, 1945. There came first disastrous success in an explosive fission-chain reaction. Then came Hiroshima and Nagasaki.

In every case the fateful atom was either uranium 235 (U235), or plutonium derived from the atom of U238 on U235. Every pound of U235 atoms split by three megaton-sized bombs yielded the energy of 11.4 million kilowatt-hours, or 1600 tons of coal—equivalent to power for plutonium.

No matter whether you power generators, the purified enriched uranium (Fig. 1) always contains 99.3% of the "parent" isotope U238, and a mere 0.7% of the parent U235.

Its atom is by its very nature, the second son in the nuclear—a hunched mass of protons and neutrons, each weighing unit and. The protons are electrons. Each proton (because plus electrical charge) and electron are equal opposite charges. There must be as many negative electrons as positive protons in the nucleus. This is also the "number" of the atom. Neutrons have no charge, but add weight.

The atomic number of uranium is 92 because the uranium atom always has 92 positive protons and 92 electrons. The number of U235 and U238 differ only in the number of neutrons: U235 has 143 neutrons, and weighs 92 + 143 = 235 units. U238 has 146 neutrons, and weighs 92 + 146 = 238 units.

Ordinary chemical reactions, such as TNT explosion, release only a fraction of

the modest energy of the whirling electrons in the outer atom. Nuclear reactions unlock the immensely potent energies which bind together the nucleus.

Even the gentle heat of a disappearing neutron buffer will split the atom of U235 or of plutonium plutonium into two medium-weight atoms, yielding also one or three spare neutrons plus energy. Then these fissionable materials give birth to their own fission, and a highly sensitive bit of high-explosive trigger—a perfect setup for a chain reaction (Fig. 2).

Chain reactions work like chain letters. Neutrons from one nuclear explosion hit and explode other nuclei. But, some atoms are nearly open spaces a chain started as a small block of U235 or plutonium quickly does not become more of the released neutrons escape from the block.

The bigger the block, the smaller will be the percentage of escaping neutrons, and the more likely to split other nuclei. When the block is rapidly built up beyond a certain point, the fragments of 1000 nuclear fissions split many more than 1000 additional nuclei. Then fissions multiply geometrically, and the block disintegrates with explosive speed and violence—as in a bomb (Fig. 3).

This bomb explosion is a fission-chain reaction. For economy and ease of control, reaction piles for the gradual release of nuclear energy for commercial purposes will usually use a lean fuel—first in U235 or plutonium diluted with U238, thorium or other less costly materials.

To maintain a chain reaction each pile must be large and sufficiently surrounded by strong neutron blocks or some other moderator (Fig. 4) to slow many of the neutrons. Slow neutrons make more likely than fast neutrons because there is more time for them to be captured from a straight path by the situation of nearby nuclei, as shown below.

4 SLOW NEUTRONS MAKE MORE HITS

A slow neutron is more easily swerved from a straight line



THE FUTURE U235 ATOM HAS SEVEN MORE, on average, enough neutrons of least energy for power generation, constant heating or industrial processes. Precise proportions of atomic elements will use dilute U235 or plutonium ore "rich" mixed with carbon or some other moderating to slow some of the neutrons and then keep the chain reaction going.

The diluting agent may be either U238 or thorium, or both. These will be double debt, because neutron bullets convert U238 into the energy-yielding plutonium, and thorium into U233, which may prove equally workable.

Thus the commercial piles of the future will "burn" U235 to make other atomic fuels, plutonium and possibly U233, which in turn will dilute heat energy to the pile. In this way it will be possible to get from the pile far more heat than the equivalent of 1400 tons of coal for each pound of U235 split. This highly attractive prospect will speed the day when nuclear energy can compete with coal.

While already commercially available, the pile-making plutonium for bombs at Hanford, Wash. (Fig. 1) avoid the basic principle on which fission piles for power and heat will operate. The best new work at a vast quantities will be put in work. The plutonium, now required for bomb manufacture, will be prepared to the pile (or left as) supplementary fuel.

ATOMIC POWER

The possible everyday applications of nuclear heat pictured in Fig. 2 have been recognized from the very first day of the Atomic Age. Year 2 will see the building of the world's first atomic power plant (a pilot plant) at Oak Ridge, Tenn.

Beyond question such installations will produce power, but it may be years or decades before they prove economical. To compete with conventional plants the piles must be redesigned to run at temperatures high enough for good power plant efficiency. Also the techniques of spreading piles by remote control through the heavy radiation screens must be radically overhauled.

The Harbison piles run on natural uranium containing only 0.7% of U235. The typical commercial atomic power plant of the future—(E) now runs 0.7% of U235 or plutonium, but less than 50%. This will avoid both the low efficiency of the too-lean mixture and the excessive fuel cost of the rich mixture. It will permit piles of moderate size and take maximum advantage of U238 and thorium as potential sources of plutonium and U233.

One should not expect U235 to replace coal gradually in this generation, although a few central power stations and ships will

try it out before Year 10 of the Atomic Age. Plants for heat, industrial sources of fuels may turn much easier to construct and therefore to concentrated heat sources, that may easily be transported even to remote corners of the earth.

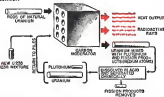
Atomic power, in forms now known, is unspectacular for automobiles and small airplanes, because of the large metal inventory in uranium and the need to carry 50 tons of shielding to protect riders and pedestrians against the deadly radioactivity accompanying nuclear fission.

RADIOACTIVE ISOTOPIES

More immediately expected than the heat and power applications of nuclear energy are the studies that the reduction of the products of pile operation can render. Because these materials act chemically like their ordinary non-radioactive cousins, but can be followed and detected easily, they are expected to play tremendously vital parts in medicine and biology. For more details, see the last page of this section.

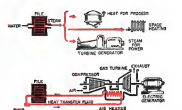
1 SLOW-NEUTRON PILE

Can make plutonium for bombs—or heat for power, process and comfort



2 PRACTICAL APPLICATIONS

Include steam for turbines, process and comfort heating—also heat for gas turbines



...or Destroy him...

Uranium 235 and plutonium are new kinds of atoms. They will build or destroy as he wishes. Man drives the world from either his destructive himself. War is proof that man as the atom has never achieved self-control. He has always sought better weapons for the perfect weapon war brings has no satisfaction for he sees in the atom bomb his own destruction as well as that of his enemy.

The ultimate benefits of nuclear energy may well surpass its present benefits, but the future has both new and awful dangers, and none want face them. He must pay this price for embarking this world of the latter times.

ATOMIC BOMB

This page, then, is about the atomic bomb. Nothing will be said here that is not either a certified scientific fact or a conclusion shared by the majority of the leading scientists, engineers and statesmen who have studied the matter.

As already explained, an explosive nuclear chain reaction spontaneously occurs through a block of U-235 or plutonium when the block is rapidly rebounded beyond a certain "critical" weight X. That weight is still a military secret; the official figure

report vaguely suggests that it is more than 4 lb and less than 200 lb. Each pound of U-235 is the densest bomb ever weight less than X. At the desired instant of explosion the bomb mechanism arranges these pieces rapidly into a single piece considerably heavier than X.

The explosion itself drives the U-235 pieces apart, thereby spending the atomic energy before all the atoms are split, so the bomb efficiency is less than 100%. For each pound of U-235 (or plutonium) actually split, the bomb releases the energy of 1600 tons of coal.

This explosion is usually achieved best at work in unopposed concentration. Each particle becomes bombarded vapor millions of degrees hot. Then, and the ensuing splash of glowing fire, radiates a blinding flash that causes human flesh at half a mile and billions at over a mile. There is a destructive shock wave (sound) and a second long barometer of atmospheric force—the overpressure of the expanding heated air. Deadly neutrons and gamma rays spread out from the bomb.

A single atomic bomb killed about 120,000 at Hiroshima. Fewer died at Nagasaki only because the nuclei of potential destruction included much water land. Bombs ten times as powerful can be made by the thousands in any industrial country with the plants and the know-how. One bomb could destroy Manhattan.

Many experts estimate that a complete set of American atomic "secrets" and blueprints would cost a foreign power less than three years at best in its race for atomic arms. With no help at all from us, any advanced industrial nation can, in five to ten years, acquire the raw materials, the plants, the know-how and enough bombs to knock out the big cities of any other country overnight. In Year 2 of the Atomic Age this arms race is already on. It will not be long before the raw materials entry country has an even work working for bombs.

THE CRUELTEST DEED

Cost no matter, then, for the atomic bomb is by far the cruellest method of destruction ever devised. General H. H. Arnold estimates that atomic bombs can be made



A drop in improved atomic bomb size decreases the square miles of city

factured and delivered for less than \$500,000 per square mile of destruction.

Don't be misled by the two billion dollars America spent on a project that dropped only two bombs on the enemy. New plants can be built at a fraction of wartime cost, and the investment spread over thousands of bombs, not just two.

NO DEFENSE

In the bomb can be made in ample quantity and paid for, but can they be delivered? The answer is: "Yes; by the time the bomb can study they can be delivered anywhere and anywhere." If the defense of the target country are weak, piloted planes can get through in ample numbers. Ten percent would be enough.

For more effective delivery radio-controlled pilotless planes and rockets can carry the atom bombs known to sound. Such weapons will be almost unassailable by either man-made or natural defenses. Greater threat of all will be the electromagnetic neutron. The German V-2 rocket, which were once was stopped by British defenses, points one way. It needs only transatlantic range (with atomic propulsion) and an atomic bomb in its nose. Very few jet long, loaded with 5000 lb of alcohol fuel and 15,000 lb of liquid oxygen, the V-2 of World War II ran 60 miles in the sky and would 200 miles in its range to deposit one ton of TNT in London.

Seeing as many strange things come to pass, the man in the street cannot shrink from possible nuclear and the impossible variety. From the very start of the Atomic Age he has been hearing the "yes" that will explode the atom bomb for all. Conscientious scientists and engineers say that cannot be.

The only way to bring down a 2500-mile-per-hour rocket at a safe distance is to shoot it with just one 4000-wp rocket. You can't win at this game after enough trouble, time and money.

The only defense against the atomic bomb known in Year 2 of the Atomic Age is to dispose of all cities and put life underhand underground. This would be very early in time, money and national morale.

MORE AND BETTER BOMBS

Some will ask whether the U. S., in the most powerful industrial nation, could not build more and better bombs and carriers than any other nation. Probably yes, but there is no moral concern. If the "weak"

opponent has enough atomic weapons to destroy at once, what advantage is there in being able to destroy him twice?

Showing first could prevent us now, but not after the world is atomically armed. If we were to destroy the enemy's cities, we would probably lose his well-considered and protected bomb magazines and rocket launchers. A few months later he could mean the atomic fire. In brand standards, that is the picture of future atomic war. Horribly loss.

At this point one group at another states: "If everybody is to lose who would be as foolish as to start an atomic war? And don't the Germans in France from using gas for a shorter season?" Possibly yes. It may work that way. But in a world

atomically armed to the teeth some two-finger may pull the first trigger.

ONLY ONE WAY OUT

Throughout history some effective weapon has ruled out its appropriate defense. But now the offense brings casualties ahead in a single bound and the defense has almost helpless everywhere, unless some radical prevention, unknown at Year 2 begins, can be devised.

The situation is seriously dangerous. There is no other way out except through some sort of international action first to stop the atomic arms race now, before it is too late, to be able to work.

Can't be done? Perhaps not, but there is an alternative except atomic chaos.

...so he faces the Atomic Dilemma...

THE DILEMMA

Nations must either face the probability of an atomic World War III, which would surely be the most deadly in history . . .

Or, the experts propose, yield both atomic weapons and war potential to international authority backed by superior force.

What the Experts Say

1. It is due to two facts any major increase in atomic strength means bombs to destroy all the major cities of any other country overnight.
2. This means no "nuclear" information is other help from us.
3. The necessary weapons are all at hand.
4. The race will not be long.
5. The bombs produced are few but can be made thousands of copies by hand, or by atomically powered guided missiles working from far inland.
6. There will probably be no effective military defense against such weapons.
7. Deterrence, then, and paying key is the only defense understood, will offer some protection if accomplished in time.

but at terrible cost in money and human lives made.

8. In a world atomically armed, nations can produce no atomic strength and protect themselves from enemy attack.
9. If so, nations A can destroy the cities of any other nation B, after which B's soldiers will destroy the cities of A. Showing first will not win an atomic war.
10. This knowledge may not prevent the bigger finger of a suspicion game.
11. Bombs mean and better means war, and the other fellow won't help much if he has enough to destroy us. We are to kill a man twice or reborn when ruin.
12. Every nation is vulnerable in the Atomic Age, including the U. S. A.
13. National security will be impossible without (1) international control of atomic arms and (2) no one being there.

after) international control of all war potential, both backed by superior physical power.

14. If nations to this end in law delayed, it may become impossible to halt the atomic arms race already started.
15. At best, the necessary degree of international control, with some total delivery of national resources, will be a revolution in human affairs. It may prove to be humanly undesirable in this time. It is, now, and worse everywhere and from the probability of an atomic third world war by far the most dangerous in all history.



..and the Great Debate unfolds

while Time runs out



A year later it has probably been marked by more debate on a single subject than any other twelve months in the world's history. Social, economic and political as well as purely technical issues have been pressing for realistic solution. Let us look at those issues and on whom we stand:



CIVILIAN VS. MILITARY

Because the atomic bomb is the world's most powerful, the control issue will like to control it. But because atomic energy can also be used for peaceful, beneficial purposes, civilian control seems especially merited. These conflicting viewpoints bring strong propensities before the Congress which finally reached a fairly satisfactory compromise in the Atomic Energy Bill of 1946, setting up a semi-private and board with which the armed forces will have continuing liaison. As we move to press, just before Year 2 of the Atomic Age begins, this bill has passed the Senate, but there is still a question how rapidly it will be enacted into law.



PRIVATE VS. PUBLIC

Atomic energy is "too big" and "too hot" to be handled privately. It must be centralized and internationalized. The questions are how and in what context. Fortunately, in the "House" in these pages above, there are some who say atomic reasonable safety against abuse of the atom, and still do so without public control of many "non-dangerous" applications.



SECRECY VS. FREE SCIENCE

Throughout the first year of the Atomic Age hot debate has raged around "keeping the secret of the bomb." To protect potential enemies from making atomic bomb or even have urged a complete blockade

out of all phases of atomic energy—even of the scientific fundamentals of nuclear physics. Others have sought immediate and complete disclosure of all bomb "secrets," both scientific and technological. These have held that such information cannot be effectively hidden, that atomic bomb progress and benefits were.

A year of debate has brought the great mass of sound opinion to this middle ground: (1) Some restrictions on the exchange of basic physical knowledge; (2) Release for industry's benefit many of the devices and methods developed by the bomb project; (3) Bold fight to speed-up information on atomic knowledge and technological production such information is fully operative.

DOMESTIC CONTROL AS PLANNED IN THE ATOMIC ENERGY BILL OF 1946

McMahon Committee Bill contains the following provisions:

Policy. Declares it the policy of the U. S. to develop and utilize atomic energy to improve the public welfare, increase living standards, strengthen competitive enterprise and promote world peace.

Organization. Establishes the Atomic Energy Commission (AEC) of five administrators to direct four divisions on research, production, engineering, and military application—to work in liaison with these organizations from (1) the second forces, (2) manufacturing industries, and (3) joint Governmental organizations.

Production. AEC to own and operate (under management contracts with industry if deemed desirable) all facilities for the production of fissionable materials, such products to be distributed with their radioactive byproducts under license for private industrial and medical purposes.

Military Application. AEC to accept in development work and produce atomic bombs as directed by the President, to be delivered only on his order to the Armed Forces.

Industrial Utilization. Permit AEC to conduct research, design and construct facilities equipment for non-energy utilization, license its use, produce and sell power obtained as a byproduct in the production of fissionable materials. Devote AEC to give widest safe scope to private industries.

Control of Information. AEC to enforce a ban on the dissemination of restricted data that might be used to injure the U. S. or secure advantage in a foreign nation, not to provide license for voluntarily releasing confidential or future confidential sources.

Patents and Inventions. No private patents permitted for production of fissionable materials or their utilization for military weapons, but AEC will partly compensate for such invention, when made by private citizens. Private for non-military applications may be produced or patented by the AEC only when public interest is affected.

Appropriations. "Such sums as may be necessary and appropriate to carry out the purposes and provisions of this act" plus unexpended funds of the McMahon Energy House.



NATIONAL VS. INTERNATIONAL

Years of internationalism, the Atomic Age began when three nations discovered a weapon that today gives them the greatest military power on earth. The prime question is: Shall the atom remain the

property of its conquerors, internationalism?

During Year 1 of the Atomic Age the master report of the State Department's atomic commission, and the U.S. representatives on the United Nations Atomic Energy Commission, have all called for international control of atomic energy. Year 2 will start with no such control. This failure to decide and act to be part a natural result of the extreme difficulty of the problem and the obvious danger of atomic decisions. Nations recognize how a single decision in this Atomic Year 2 the dangers of internationalism, the dangers of internationalism, the extreme danger of not being able to make any decision in time to meet the atomic bomb threat.

Leading industrial nations now produce atomic bombs in five years, compared with approximately ten years after Hiroshima. Already the pace of the progress they have been making in delaying atomic internationalism, even if it may be too late to check the growing domination of the atomic weapons.

INTERNATIONAL CONTROL AS PROPOSED BY THE U. S. TO U. N. ATOMIC COMMISSION

Such statement follows representative path laid out by Atomic Commissions in "Arms-and-Disarmament Report":

The Plan. The U. S. has proposed that all nations band together to enforce the use of atomic energy for war and to prevent and control its development for the benefit of mankind. To this end an International Atomic Development Authority would be set up, and it is the U. S. would own area, in various states of its organization, all atomic knowledge, know-how, raw materials, facilities, and supplies of fissionable materials. This IADA eventually would supervise national authorities on some matters and supplement them on others.

Ownership and Operation. IADA would take over from national authorities all private ownership of full management and control of all atomic energy matters that affect a possible threat to World security. These include:

1. Raw Materials—Supplies of uranium and thorium to be internationalized, controlled, and developed by IADA.
2. Facilities—IADA to construct and operate plants producing fissionable materials and to own and control their products.
3. Research—IADA to undertake research and development on all aspects of atomic energy and to provide suitable right of research on atomic explosives.

Private Initiative. Will have no chance to push forward the use of atomic energy for peacetime (non-defense) purposes. With IADA providing the materials and carrying out necessary cooperation, national or private enterprise may operate "tailor-made" plants and use nuclear materials developed for research, chemical and other applications. Industries companies produced by IADA also can be developed for peacetime use.

The Mechanics of Safety. So plan is a serious provision against future abuse war. This plan should, however, prevent major attack with atomic weapons, for IADA is to enforce the ownership of management controls with wide power of inspection. Obviously, successful inspection rests on complete freedom of access or access to any arm.

Sanctions. At the heart of the plan lies the problem of preventing war. It is a matter for profound concern. To the U. S., one aspect of sanctions appears crystal clear: There is no area where the vote right now held by the five great Powers must be reduced if it is not to be inconceivable with the nation and purpose of the proposed control.

UNMILITARY—ATOM YEAR 1

1. July 26, 1945. World's first atomic bomb dropped in New Mexico.
2. July 26, 1945. President Truman and Prime Minister Churchill meet President Harry Truman at Potsdam.
3. August 6, 1945. Atomic bomb dropped on Hiroshima.
4. August 9, 1945. Atomic bomb hits Nagasaki.
5. August 12, 1945. Army releases Smith Report on "Atomic Energy for Military Purposes."
6. August 14, 1945. Japan accepts terms of Potsdam Declaration.
7. November 15, 1945. Truman-Acheson-King issue declaration of intention and procedures looking toward international control of atomic energy by United Nations.
8. March 16, 1946. State Department issues Acheson-King Report on the "International Control of Atomic Energy."
9. April 12, 1946. Washington Engineers Union announces program for experimental development of atomic power.
10. June 1, 1946. "Atomic Energy Bill of 1946" passes Senate unanimously, is referred to House of Representatives.
11. June 14, 1946. First meeting of United Nations Atomic Energy Commission (Edward R. Roybal as American member). Hiroshima. Double anniversary recalls history of radioactive isotope for research use.
12. July 1946. Joint Army-Navy tests of atomic bombs in Bikini.

...but if Man Masters Atom...

IF METAL INDUSTRY by the atom bomb can be evolved, the first century of the atomic age will bring immense advances in scientific knowledge, health and living standards. Already many prospective benefits can be outlined, but those that can neither become nor suggest may be even more important.

This prediction is grounded in scientific experience; the most fundamental discoveries have always been the most fruitful. The study of molecules gave us chemistry. Faraday's experiments with electricity and magnetism are the foundation stones of the great electrical industry. Can one expect any less from an understanding of the heart of energy?

ADVANCE

Atom-splitting benefits clearly include today's life widely in three classes: (1) heat and power applications of the atom; (2) general industrial applications of equipment and methods originally developed for the bomb project; (3) disease, diagnosis and medical uses of the "nuclear atom." (Radioactive isotopes) now already only available from pile operation.

It is now evident that the energy yield of the U235 as an atomic pile can be multiplied many times by extending its life instead of the pile for plutonium and possibly the U238 produced respectively from the U235 and the thorium in the pile. This is as advanced way to "burn" successive U238 and thorium, and thus greatly extend the supply and reduce the cost of atomic fuel.

POWER APPLICATIONS

Although present piles run at low temperatures, it is certain that temperatures high enough for the efficient operation of steam and gas turbines will be attained. Already an experimental atomic power plant has been achieved. Atomic power for remote remote installations (see, for example, Atomic Energy) may not be far off.

In five or ten years massive piles will be driving a few experimental ships and submarines. In 20 or 30 years uranium may begin to replace widely used coal as a fuel for mainly shunted large central heating and power plants. The 34 ton minimum weight of shipping rules out nuclear power for commercial and small piled plants.

SPECIAL USES

Some day charcoal respirators from splitting atoms will be used for special industrial operations on acids and other materials. Even the dread atomic bomb might easily serve peaceful ends—blowing holes in dams, changing the course of rivers, leveling mountains.

INDUSTRIAL HYDROGEN

The special industrial equipment and methods developed for the bomb project will find hundreds of important uses—mostly for purposes unrelated to atomic energy. These developments include pumps with neither seals nor leaks, heat detectors of amazing sensitivity, ultraviolet welding, a portable mass spectrometer for quick and accurate gas analysis, new ways of handling extremely hot and poisonous materials, new reference barriers for the separation of gases and of petroleum products.

OTHER ATOMS

Yet more important than any of these, in the long run, will be the benefits of radioactive isotopes now available to hydrochemists of pile operation. Obviously indispensable from the ordinary forms of the elements, these isotopes serve as tagged atoms, or "spies," it could with atomic stable atoms of the same species. They "fly with the flock," and one later is identified as surely as banded birds. With these sensitive tools of research, the course of any element or compound may be traced through the bodies of man, sea and plants. Similarly, tagged atoms

may be used in studying the course of many kinds of industrial and chemical operations.

BIOLOGY AND MEDICINE

A recent hyperthyroid condition can be diagnosed by finding the extent a minute measured amount of radioactive iodine. The risk of a "Gadget" reactor placed on the patient's neck will tell (1) what percentage of the available iodine is absorbed by the thyroid and (2) how rapidly that concentration is accomplished—giving a definite indication of the state of the gland.

In similar fashion the radioactive isotopes of hydrogen, oxygen and carbon will trace the intricate biochemicals of carbohydrates and proteins in the human body. Radioactive phosphorus will explain the bones. Radioactive iron will show how and where blood cells are formed. Radioactive sodium will trace the circulation of blood.

USE IN INDUSTRY

In studying the radioactive isotopes will speed the understanding of work, health and repair machines. In industry they will measure flow, detect leaks, and do other useful work.

Meanwhile the random piles will be manufacturing certain radioactive isotopes that can serve as cheap but effective substitutes for high-cost medical isotopes.

KNOWLEDGE COMES FIRST

It is already clear that the chief benefits of atom splitting will come first as new scientific knowledge rather than as new engines and gadgets. But in the long run man's new understanding of the inner atom will enrich the whole nature of human culture. This has always been the case with new fundamental discoveries in science. It can hardly be less with this most fundamental discovery.

PRODUCTION

Canadian Aircraft Industry Swings Into Post-War Production

A. V. Roe enters pact with Taylor II, jet propelled fighter and conversion of Lancaster, British-U.S. capital equal.

Parted by the war to become an important producer of aircraft, Canada emerged from the war with usable aviation manufacturing facilities as which an industry has been quick to respond. While no engines are yet being made in the Dominion, domestic aircraft designs are more numerous, and production for ahead of present day.

Strengthening the overall framework in the entry into Canada of A. V. Roe Ltd., one of Britain's major firms. In aircraft manufacturing, within its most other Canadian industrial fields, British capital is equal to, if not greater than that from the U.S. In addition to Avro de Montreal, Percival and De Havilland have Canadian divisions. U.S. companies with subsidiaries in Canada are Fairchild, Piper, Pratt & Whitney, and Curtiss-Wright.

Most aircraft production is concentrated

in eastern Canada, with the bulk of it being done in the Montreal and Toronto areas. At Montreal, Canadian Car & Foundry Co., Ltd., is now producing Northrop Mustangs V aircraft powered by Pratt & Whitney 1600 hp engines. For domestic use and export, primarily to the Latin American countries.

Canadian Car & Foundry also has produced a prototype of the British CBY-3 "Flying wing" passenger aircraft, but has not yet gone into production of this aircraft.

Canadair Ltd., Montreal, a government-owned company, is now producing a Canadian version of the Douglas C-47 for Trans-Canada Air Lines and for export. Aircraft will be powered with Rolls-Royce Merlin engines and will be used in TCA domestic and international and transoceanic routes. Initial or-

der is understood to be for 56 aircraft. Company is also converting war surplus DC-3 aircraft for TCA. Fairchild Aircraft Ltd., Montreal, has started production on a new Canadian-designed twin-engine, 7-11 Shrike, a 7 to 8 passenger all-metal transport or cargo plane, designed following a survey of bush pilot requirements. Plans are expected to be in production late this autumn and are to be available with wheel, six or piston landing gear, and powered with new or used Pratt & Whitney Wasp S5B or T16D engines.

Engineering Products of Canada, Ltd., Montreal, is building the first Canadian helicopter, the Sikorski HO4S Mark VI. Prototype was scheduled to be ready during the summer. It is designed to carry two passengers and pilot, plus 100 lb of baggage.

In Ottawa, the largest manufacturer is A. V. Roe, operating jointly with the Canadian government the former government-owned Victory Aircraft, Ltd., Toronto. Roe is taking up the manufacture Taylor II biplane for North American use, in designing jet propelled fighter for the Royal Canadian Air Force, is converting Lancaster aircraft for use by TCA as Trans-Atlantic 39 passenger transports, and is serving three converted planes after 2400 miles. Roe also has taken over Canadian government's Taurus Research, Ltd., Toronto and has a contract for design and development



MAINTENANCE AND SERVICING SIMPLIFIED IN SATURN

Some of the main serving points of Lockheed's new feeder plane are illustrated in these photos. One relief feature common to almost all maintenance and servicing on the Saturn is the fact that in few instances it is a ramp or ladder necessary. The longest main wing open

to expose the back of the instrument panel, respective and elevators of engines can be made without a ladder, the overwing fairings permits loading of cargo without special equipment. The main door, only 34 inches above the ground level, has fold-down steps.

ATOM SPLITTING WILL SERVE MAN IN:





STRATOVISION PLANE

Coding lately over a fixed course at 20,000 ft altitude, this Lockheed Ventura, leased to Westinghouse Electric Corp. by the Navy, is being used to flight test "Stratovision," Westinghouse plane for greatly extending low-flight coverage of television and FM radio stations. The plane picks up ground signals and relays them from a transmitter in the plane. The converted stratosphere plane will be a Martin 303, designed for 22,500 lb gross weight.

of gas turbines and of jet engines.

De Havilland Aircraft of Canada, Toronto, branch of the British concern, is manufacturing the Vixen four-place biplane powered with Gypsy Major engine, and a new elementary trainer for civilian and RCAF use, the all-metal Chipmunk low-wing monoplane powered with Gypsy LC engine. Other aircraft for RCAF are under development in design at this plant.

Perovsk Aircraft (Canada) Ltd., has leased space at the De Havilland Aircraft, Toronto, but has not yet started manufacture at the Perovsk Plant.

Cole Aircraft of Canada, Hamilton, Ont., is producing Piper Cub two-place aircraft at rate of one daily, experts say. It produces Super Crusier and Argus aircraft of the parent American company.

Flight Aircraft, Ltd., Fort Erie, Ont., has started production of a two-place trainer of Canadian design, the Canada, a fabric-covered high-wing monoplane, powered with 75 hp Continental Lycoming or Franklin engine. Company also plans production of other personal and freight aircraft, having built the Fleet Freighter before the war.

Mokey Aircraft, Ltd., Sheshep, Ont., a newcomer in the field, has built the prototype of a two-passenger high-wing monoplane, the Novada, powered with 65 hp Continental engine. Aircraft is available with cabin, six or positive landing gear.

Norwest Industries, Ltd., Edmonton, only western Canadian air-

craft manufacturer at present, is building Bellanca Skyrocket and Aerostar under license, for sale in Canada, Alaska and for export.

A number of other companies are converting war surplus aircraft for commercial and private use at Montreal and Toronto Pratt & Whitney, Canadian Wright and Rolls-Royce have Canadian engine assembly and repair plants at Montreal. Many companies, formerly imported, are now made in Canada.

Pay Load Factors Influence Design

Planes undergoing the decision to make 14 the top passenger capacity of Lockheed Aircraft Corp's Stratus—the first of the true post-war Stratus—have been revealed in a study of engineering problems of small transport design by Willis M. Hawkins, Jr., Lockheed chief preliminary design engineer.

Most important is an evaluation of potential profit for airplanes carrying respectively five, 14 and 24 passengers. Surprisingly enough, the Hawkins study shows that the five-passenger plane could never make money, assuming it were to be used in local operation with a typical range of 300 miles and with a constant factor of 10 percent direct operating costs was proved.

► **Money In Factor**—For both the 14-passenger plane, operators could make money at 10 percent load factor, with the larger aircraft, at

course, producing the greater revenue. But the catch, as outlined by Hawkins, is the potential traffic available. The 14-passenger airplane begins making money at seven and one-half "payload units." The larger plane reaches this point at slightly less than 13 units.

This means that in the open of Hawkins the 14-passenger plane is the better bet for local operators starting a new service in unexplored territory. With it, they would have a greater chance of making money during the period necessary to build up traffic.

► **Thoughts on Power**—Hawkins also has some provoking thoughts on the use of surplus high-power engines in an attempt to achieve initial economy. The Stratus will use either Wright 650 hp or Continental 600 hp engines. He points out that an economic mix would be possible only if the engines could be operated with long overhaul periods, if their first cost would be far below new engines, and if the added power would increase operating speeds and gross weight.

Therefore, he assumes that high-powered surplus engines would cost one-half as much in new, lower-powered engines and that the surplus engines could be operated 750 hrs, instead of 500 hrs between overhauls. On this he based a chart showing the relative direct operating expense of the two types of engines. At less than 100 miles—considered ample for local operations—the new, lower-powered engines are cheaper in expense.

Canopy of Plastic Offers Good Vision

In one form or another, the "Baggy" cockpit canopy developed by Douglas Aircraft Company, and exemplified on the C-74 Globemaster shows promise of becoming a trend for future transport designs, especially for very large aircraft where good visibility is difficult to obtain.

The plastic bubble, which some pilots and airline engineers have assumed will constitute a real barrier to eye members, subject to disintegration rapidly is winning the confidence of all who have flown the C-74 or who have had realistic demonstrations at Douglas Santa Monica plant.

► **No Glass Problem**—For clear-sightedness, Ben O. Havard, assistant to the president of Douglas, who flew several tests of the C-74 has the assurance that pilots actually



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EDO AIRCRAFT CORPORATION, 980 Second Avenue, College Point, Long Island, N.Y.



Based on "Bag-Eyes" Radford design, here is pilot cockpit canopy design that features the Douglas DC-7's Galassimor is apparent in this head-on view.

experience note of the "cropped up" aviation which may be expected to result from riding with one's head in a bubble.

As used on the C-74, the "Bag-eye" gives the pilot a complete sense of cockpit readiness through excellent vision across to the sides, unimpeded and unobstructed panel facing within the "Bag-eye" his eyes are barely above the skyline of the airframe, and a slight downward glance shows the array of instruments and controls.

A novel "Bag-eye" accessory is a fabric "glare shield," which the pilot can attach across beneath the cockpit man to exclude, as desired during the night, all radiation from instruments and cabin lights.

Safety Factor—Several facts that the greatest advantage of the bulbous canopy is the safety factor of unusual flight vision afforded the flight crew, pilot and co-pilot. Each can command 360 degree vision in a forward sitting posture, and excellent vision upward, and also down, in comparison with conventional cockpit window arrangements.

AAF Experimental Contract Buys Menasco Backlog

Buying of the Menasco Manufacturing Co. is now in process of \$1,000,000, following a new experimental contract with the AAF for 12,000,000. This contract is for work on gas turbine and jet engines, ex-

pecting a related activity that Menasco has been conducting for Lockheed Aircraft Corp.

Menasco's backlog now includes orders amounting to \$2,985,463 for hydraulic landing gear for both military and commercial aircraft, order totaling \$1,001,146 for washing machines, and orders of \$404,351 for hydraulic jacks for industrial, aircraft, and railroad use.

Ryan Metal Products Makes Metal Casket Shells

Broadening of Ryan Aircraft Co.'s production in non-aviation fields through its Metal Products Division has brought orders for \$500,000 worth of metal shells for casket manufacturers. Ryan will be in volume production on the orders by July.

The casket shells, of Ryan's own design, were recently shown to casket industry representatives at Kansas City. The heavy orders followed. Ryan began planning the design early this year, after considerable study of potential non-aviation markets for its metal fabrication facilities.

All of the company's consideration of expanding the field of sales for its metal products has been based on the desire to build a permanent, and not temporary business, product T. Claude Ryan explains. He points out that in this period of consumer goods shortages volume orders can be obtained for a great many products.

Ryan's interest, however, is for the long pull, and consequently the company has been choosy about entering the non-aviation field. In the aviation field, the Metal Products Division has large orders for exhaust manifold systems for several of the transports now in production. It also is working on high temperature alloy parts for jet propulsion engines.

Fairchild License

Fairchild Engine and Airplane Corp. has licensed Burtis Perrins and Co., Inc. of Denver, to manufacture plastic molded bonded plywood under Duracold patents where Fairchild holds. The contract runs for five years and the Denver company will use native materials.



JET TEST ON MARAUDER

Installation of a Warrington 18-2 jet engine in the tail of a Marauder bomber has been made by The Glenn L. Martin Co. for experimental purposes. Ground is to test jet engines under actual flight conditions. An outline for the engine is at the top. The plane retains its two conventional engines. The tail turret has been reconstructed for an observer who keeps watch on the performance of the jet engine through a window installed in the fire-wall.



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Continental Air Lines Serves Sears, Roebuck

Continental Air Lines completes the payroll of every one of its six flights daily from Kansas City to Denver with freight for Sears, Roebuck customers in Denver, Colorado Springs and Pueblo. This air freight business already has grown to such proportions that Continental is preparing a C-47 to fly a shuttle freight run between Kansas City and Denver.

The arrangement gives Sears customers in the three Colorado cities a service not more than 24 hrs. and usually not more than 12 hrs. between the company's Kansas City Warehouse and their homes. The five days to two weeks previously required handicapped the shopper in its competition with Montgomery Ward, which has a big retail store and warehouse for mail orders in Denver.

Orders taken by Sears in the three Colorado cities up to 3 p.m. each day are shipped to Kansas City and the goods retraced to the air field for loading in cargo spec is available, usually up to 1,000 lbs. a ship. At Denver, the shipments are distributed to customers' homes by Sears trucks directly from the airfield, those for Colorado Springs and Pueblo leaving on the next flight, usually Tuesday. Shipment loads for the week's deliveries usually weigh 300 lbs.

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For "Continental" Beyond Colorado's borders, Sears, Roebuck are receiving freight delivery on shipments from the company's Kansas City warehouse via Continental Air Lines. Picture shows a group of officials loading 1,000 lbs. of "Continental" purchases on a C-47 plane at Kansas City to start the service.

The shipments are handled by Continental on its new tariff which begins at 28.5 cents a ton-mile and scales down to 20.5 cents for 2,000 lbs. or more. Sears charges the customer a delivery charge of 15 cents for 5 lbs. up to all items over 100 lbs. The cost is more than parcel post by which most Sears items formerly were delivered from Kansas City, and the delivery charge does not quite cover cost of the service to Sears, but the mail order house thinks customer satisfaction makes up for the difference.

Continental figures it can extend the service to other and more remote markets nationwide as soon as they are covered by air with Denver through feedlines now being made ready. John A. Heath, the owner's vice president, and James E. Port, Sears' manager of air operations in Denver, worked out the arrangement, which Sears calls its "airborne delivery shipping service."

Peggie Has Office

Office space in the Carlton hotel, Washington, has been taken by L. Welch Pogue, former chairman of CAR, and George Neal, formerly the Board's general counsel. Neal left the Board July 1 and Pogue 14 days later after his dismissal. James H. Laidlaw, now owner in Pogue and Neal, resigned to enter private law practice, but under CAR rules, neither may appear before the Board in connection with any proceeding that was under Board consideration while he was at CAR.

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Feeder Line Expansion and FAA

RECENT OBSERVANCES by CAB of 1,000 miles of feeder airline routes for seven new carriers, with other favorable decisions pending, points up the annual meeting of Feeder Airlines Association, scheduled for Aug. 5 in Washington, as the group's most important conference. The executive committee of FAA has outlined an active program for the next year, which will be approved by the membership next month.

The primary problem of the Association is its transition from an organization of applicants to one of operators. Presently, FAA has 18 strong members. Four have already been certificated as carriers. Four more have been recommended by examiners, and several others will undoubtedly receive federal approval. Other new memberships in the Association are imminent.

FAA was organized only two years ago by a progressive group of CAB applicants as a medium of collective expression and action. Top priority was assigned to securing interest in Washington in establishing a secondary short-haul air transport system which would supplement existing trunk airlines.

Immediately after its formation, the Association appointed a technical committee which drew up specifications for an aircraft which would meet the requirements and special conditions encountered in short-haul small field operation.

Three major manufacturers have designed feeder craft following the committee's general specifications as closely as possible. FAA executives point out, and there is a possibility that two others will enter the field with models for which plans are already completed, although no work on mock-up or prototype has been completed.

In its early history, restricted mainly to promotional activities, the Association otherwise has concentrated wisely on the necessarily intangible problems of information and education in Washington, a field which the senior and large trunk airlines ignored for so many years, yet were per-

plexed at the lack of understanding of their problems.

To date, the Association has been financed mainly by the support of its united membership. No individual company derives any direct benefit. Yet the Association's program has been carried on in the interest of all independent applicants, members or not.

The annual meeting is expected to attract CAB Chairman Landis and other CAB representatives, officials of the Aircraft Industries Association, spokesmen for CAA, the Post Office Department, radio specialists from the industry and Aeronautical Radio, Inc., and at least four manufacturers—Beech, Boeing, Consolidated, and Lockheed. Discussions will include Parts 63 and 61 of the Civil Air Regulation and their application to short-haul airlines, possibility of simplifying and setting up new regulations for feeder operations, air mail problems and procedure, radio technicalities, and the vital subject of the Association's future program.

The next several years will bring discouraging problems. Some even now appear insuperable. There are skeptics questioning the economic and operational impracticability of a self-supporting feeder airline system. Nevertheless, CAB will continue to grant new certificates in coming months. American News has already forecast a 20,000-post-mile network after the last decade of the eleven regional cases has been handed down. That's nearly four times the mileage which has already been granted, although none is yet in operation. The FAA is worthy of the closest support and cooperation from all aviation interests in the trying period ahead. The present American airline network was not built by skepticism and doubt, but the early trunklines wanted several important and costly years lacking the unity and cooperation of an organized industry. The feeder carriers have the opportunity to start as a strong organization to meet common problems together.

ROBERT H. WOOD



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NEW PLANES FEATURED AT OPENING OF G-E FLIGHT LAB



Visitors inspect a helicopter and a B-24 in front of one of the buildings used for electronic and armament research



A Navy MARS flies over one of the laboratory's test planes in which a gas turbine is installed for experiments

Many of the newest Army, Navy, and commercial planes demonstrated what they could do recently before an audience of thousands of people, when G.E. dedicated its new flight-test headquarters—established for the purpose of furthering new developments in equipment for aviation. It was the largest assemblage of new planes yet seen in one place—and many of these planes carried G-E equipment.

Some of the newest equipment on the war planes never saw combat, and work on it will continue in co-operation with the armed forces here at the Schenectady airport. On the large transport and commercial planes—Strato-cruiser, Constellation, and Globemaster—G-E electric equipment, such as generators and other power devices, will be used in quantity as the manufacture of these huge ships gets under way.

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